

Design Practices: Ruggedizing COTS for Military Use- or- Technology Trends
Choosing the Right Media for Rugged COTS Data Storage

Ofer Tzur, M-Systems. ofert@m-sys.com

The cost and time of customizing data storage for military and space systems, on the one hand, and of assessing the potential risks of using COTS to achieve required ruggedization and reliability levels, on the other hand, continues to be a central issue for designers of mission-critical applications. Although it is clear that hard disks are inappropriate for military systems due to their inherent reliability problems under harsh environment conditions (rotating mechanical heads), other COTS data storage products are available that meet mission-critical requirements.

This presentation will discuss the pros and cons of some such COTS solutions for mass storage, including ruggedized mechanical hard disks and solid-state flash disks, which were originally developed for commercial environments but whose silicon characteristics make them a cost-effective solution for a wide range of mission-critical military and space electronics applications. It will compare operating temperature ranges, vibration and shock levels, capacity, cost and power consumption, providing attendees with the facts to make informed decisions and to understand the trade-offs when choosing a data storage media. The endurance and data reliability of solid-state flash disks will also be discussed, including wear-leveling, bad block management, remote monitoring, EDC/ECC and power cycling. Finally, ways to enhance flash disk security will be reviewed, such as quick and irreversible erasure. This is important to prevent unauthorized data dissemination among unauthorized and enemy sources.